

DaimlerChrysler AG

Patent claims

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1. A directly injecting internal combustion engine, with at least one cylinder which has a combustion space and in which a piston executes an oscillating movement, and with an injection nozzle for the injection of fuel
- 10 into the combustion space, the piston having a piston recess which has in its central region an elevation extending in the direction of a cylinder head, characterized in that a surface (13) of the piston recess (10) which adjoins the elevation (11) in the
- 15 direction of the recess edge (12) is connected to the elevation (11) via a radius (14) in such a way that an injection jet (9a) impinging in this region and injected at the earliest possible time point is distributed both in the direction of the elevation (11)
- 20 and in the direction of the recess edge (12), and in that the surface (13) adjoining the elevation (11) in the direction of the recess edge (12) has an extent in the direction of the recess edge (12) such that an injection jet (9b) injected at the latest possible time
- 25 point impinges onto the surface (13), the injection jet (9b) injected at the latest possible time point being distributed both in the direction of the elevation (11) and in the direction of the recess edge (12).
- 30 2. The directly injecting internal combustion engine as claimed in claim 1, characterized in that a surface (23) connected to the recess edge (12) adjoins the surface (13) adjoining the elevation (11) in the direction of the recess edge (12).
- 35 3. The directly injecting internal combustion engine as claimed in claim 2, characterized in that the surface (23) connected to the recess edge (12) is

connected via a radius (22) to the surface (13) adjoining the elevation (11) in the direction of the recess edge (12).

5 4. The directly injecting internal combustion engine as claimed in claim 2 or 3, characterized in that the surface (23) connected to the recess edge (12) forms an acute angle with the upper surface (25) of the piston (6).

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5. The directly injecting internal combustion engine as claimed in claim 2 or 3, characterized in that the surface (23) connected to the recess edge (12) forms an obtuse angle with the upper surface (25) of the piston (6).

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6. The directly injecting internal combustion engine as claimed in one of claims 2 to 5, characterized in that the surface (23) connected to the recess edge (12) merges in a radius (26) into the upper surface (25) of the piston (6).

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7. The directly injecting internal combustion engine as claimed in one of claims 1 to 6, characterized in that the surface (13) adjoining the elevation (11) in the direction of the recess edge (12) has an ascending gradient in the direction of the recess edge (12).

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8. The directly injecting internal combustion engine as claimed in claim 7, characterized in that the surface (13) adjoining the elevation (11) in the direction of the recess edge (12) is of essentially planar design.

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9. The directly injecting internal combustion engine as claimed in claim 7, characterized in that the surface (13) adjoining the elevation (11) in the direction of the recess edge (12) is of curved design.

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10. The directly injecting internal combustion engine
as claimed in one of claims 1 to 9, characterized in
that the injection angle (α) of the injection nozzle
5 (7) is between 50° and 120° .